

CLAIMS

What is claimed is:

- 1 1. A method, comprising:
 - 2 substantially simultaneously reading values from a
 - 3 plurality of registers;
 - 4 parsing a particular instruction, and determining a
 - 5 select number of registers to be modified in the plurality of
 - 6 registers;
 - 7 modifying a subset of the values in the select number of
 - 8 registers; and
 - 9 substantially simultaneously writing the values to the
 - 10 plurality of registers.
- 1 2. The method of claim 1, further comprising:
 - 2 providing a means by which an entire set of values may
 - 3 be collectively read or collectively written by instructions
 - 4 that operate on the entire set of values.
- 1 3. The method of claim 2, wherein said substantially
- 2 simultaneously reading includes reading values from a
- 3 plurality of predicate registers.

1 4. The method of claim 1, wherein said substantially
2 simultaneously reading includes reading values from a
3 plurality of Not-a-Thing (NaT) registers.

1 5. The method of claim 1, wherein said parsing a
2 particular instruction includes parsing an Itanium
3 instruction.

1 6. The method of claim 5, wherein the Itanium
2 instruction selects one register to be modified.

1 7. The method of claim 5, wherein the Itanium
2 instruction selects two registers to be modified.

1 8. The method of claim 5, wherein the Itanium
2 instruction selects 48 registers to be modified.

1 9. The method of claim 5, wherein the Itanium
2 instruction selects up to 63 registers to be modified.

1 10. The method of claim 1, wherein said substantially
2 simultaneously writing includes writing the values to a
3 plurality of predicate registers.

1 11. The method of claim 10, wherein the plurality of
2 predicate registers includes all 63 predicate registers.

1 12. A method, comprising:

2 providing a prediction for a predicate in an
3 instruction;

4 setting a first set of values for selected predicate
5 registers in a predicate register file according to the
6 prediction;

7 obtaining a second set of values which represents
8 determined values for the predicate, the second set of values
9 being computed by a read-modify-write operation;

10 comparing the first set of values with the second set of
11 values; and

12 flushing an instruction with incorrectly predicted
13 predicate and any dependent instructions from the pipeline if
14 the first set of values are different from the second set of
15 values.

1 13. The method of claim 12, wherein said performing a
2 read-modify-write operation includes:

3 substantially simultaneously reading all values from all
4 the predicate registers in the predicate register file,
5 including the first set of values for the selected predicate
6 registers.

1 14. The method of claim 13, wherein said performing a
2 read-modify-write operation includes:

3 parsing the instruction, and determining the selected
4 predicate registers to be modified.

1 15. The method of claim 14, wherein said performing a
2 read-modify-write operation includes:

3 modifying the first set of values in the selected
4 predicate registers.

1 16. The method of claim 15, wherein said performing a
2 read-modify-write operation includes:

3 substantially simultaneously writing the values to all
4 the predicate registers in the predicate register file,
5 including the second set of values.

1 17. The method of claim 12, wherein said providing a
2 prediction for a predicate includes providing a prediction
3 based on history of the predicate.

1 18. The method of claim 12, wherein said setting a
2 first set of values includes setting 1, 2, 48, or up to 63
3 values depending on the instruction.

1 19. The method of claim 18, wherein the instruction is
2 an Itanium instruction.

1 20. The method of claim 12, wherein the first set of
2 values includes predicted values for the predicate.

1 21. The method of claim 12, wherein the second set of
2 values includes architecturally correct values for the
3 predicate.

1 22. The method of claim 12, further comprising:
2 providing a means by which an entire set of values may
3 be collectively read or collectively written by instructions
4 that operate on the entire set of values without a need for
5 the read-modify-write operation.

1 23. A computer readable medium containing executable
2 instructions which, when executed in a processing system,
3 causes the system to perform a read-modify-write operation,
4 comprising:

5 substantially simultaneously reading values from a
6 plurality of registers;

7 parsing a particular instruction, and determining a
8 select number of registers to be modified in the plurality of
9 registers;

10 modifying a subset of the values in the select number of
11 registers; and

12 substantially simultaneously writing the values to the
13 plurality of registers.

1 24. The medium of claim 23, wherein said substantially
2 simultaneously reading includes reading values from a
3 plurality of predicate registers.

1 25. The medium of claim 23, further comprising:
2 providing a means by which an entire set of values may
3 be collectively read or collectively written by instructions
4 that operate on the entire set of values.

1 26. A computer readable medium containing executable
2 instructions which, when executed in a processing system,
3 causes the system to process registers in an out-of-order
4 processor, comprising:

5 providing a prediction for a predicate in an
6 instruction;

7 setting a first set of values for selected predicate
8 registers in a predicate register file according to the
9 prediction;

10 obtaining a second set of values which represents
11 determined values for the predicate, the second set of values
12 being computed by a read-modify-write operation;

13 comparing the first set of values with the second set of
14 values; and

15 flushing an instruction with an incorrectly predicated
16 predicate and any dependent instructions if the first set of
17 values are different from the second set of values.

1 27. The medium of claim 26, wherein said providing a
2 prediction for a predicate includes providing a prediction
3 based on history of the predicate.

1 28. The medium of claim 26, wherein the first set of
2 values includes predicted values for the predicate.

1 29. The medium of claim 26, wherein the second set of
2 values includes architecturally correct values for the
3 predicate.